



Docket No.: SON-2363  
(80001-2363)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:  
Toshihiko Senno et al.

Application No.: 10/067,347

Confirmation No.: 4610

Filed: February 7, 2002

Art Unit: 2874

For: OPTICAL COUPLING DEVICE

Examiner: S. H. Pak

**REPLY BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is a Reply Brief under 37 C.F.R. §41.41 in response to the Examiner's Answer mailed on September 9, 2004.

All arguments presented within the Appeal Brief of July 29, 2003 are incorporated herein by reference. Additional arguments are provided hereinbelow.

The Examiner's Answer contends that claims 50-64 stand or fall together and claims 65-79 stand or fall together. In response, this contention misrepresents the grouping of the claims on appeal.

**Claims 50, 53, 57, 59-63**

Claims 53, 57 and 59-63 are dependent upon claim 50. Claim 50 includes the features of:

an optical lens array including a lens substrate made from an optical material and having a plurality of convex portions extending therefrom, a convex portion of said plurality of convex portions having a convex shape and comprising a material the same as that of said lens substrate,

said lens substrate having a mask layer on the surface thereof, said mask layer comprising a material different than that of said lens substrate,

a height of said convex portion being specified on the basis of a thickness of said mask layer.

The Examiner's Answer contends that U.S. Patent No. 6,434,297 to Althaus et al. (Althaus) teaches the presences of convex portions 10 (Examiner's Answer at page 4). However, please note that while Althaus arguably teaches the presence of a silicon wafer 10, Althaus teaches the presence of a convex projection 11 (Althaus at figure 3, column 4, lines 21-23).

The Examiner's Answer contends that Althaus teaches the presence of a mask layer 13, and that the height of the convex portion 11 is specified on the basis of a thickness of the mask layer. (Examiner's Answer at page 4). In particular, the Examiner's Answer contends that *the thickness of the mask layer specifies the height of the convex portion, because the mask layer is disposed directly on top of the convex portion and the mask layer demarcates the height of the convex portion* (Examiner's Answer at page 6).

In response to this contention, there is the presence within Althaus of the convex portion 11 (Althaus at figure 3, column 4, line 21). There is also the presence within Althaus of a metal layer 12 on the convex portion 11 (Althaus at figure 3, column 4, lines 26-28).

Within the claims, a height of the convex portion is specified on the basis of a thickness of said mask layer. But please note that within Althaus, the height of the convex projections 11 has been established, (Althaus at figure 3, second figure from the top of the page), prior to the metal layer 13 (Althaus at figure 3, third figure from the top of the page). Also note the presence within

figures 1 and 2 of Althaus of a lens 2 having a convex portion 7. However, figures 1 and 2 of Althaus fails to disclose, teach or suggest the height of the convex portion 7 being specified on the basis of a thickness of the metal layer 6.

Thus, Althaus *fails to anticipate* the a height of the convex portion being specified on the basis of a thickness of the mask layer.

### **Claim 51**

In addition to the reasons provided hereinabove with respect to claim 50, claim 51 provides that the curvature of said convex portion is specified on the basis of a diameter of said mask layer.

The Examiner's Answer contends that the diameter of the mask layer sets forth the boundary of the curvature of the convex portions of Althaus (Examiner's Answer at page 10).

In response, figure 3 of Althaus within the second figure from the top shows that the curvature of the convex projections 11 has been established prior to the existence of the metal layer 13 (Althaus at figure 3, third figure from the top of the page).

Thus, Althaus *fails to anticipate* the curvature of the convex portion 11 of Althaus being specified on the basis of a diameter of the mask layer 13.

### **Claim 52**

In addition to the reasons provided hereinabove with respect to claim 50, claim 52 provides that the curvature of the convex portion is specified on the basis of a thickness of said mask layer.

The Examiner's Answer contends that the thickness of the mask layer sets forth the boundary of the curvature of the convex portions of Althaus (Examiner's Answer at page 10).

In response, figure 3 of Althaus within the second figure from the top shows that the curvature of the convex projections 11 has been established prior to the existence of the metal layer 13 (Althaus at figure 3, third figure from the top of the page).

Thus, Althaus *fails to anticipate* the curvature of the convex portion 11 of Althaus being specified on the basis of a thickness of the mask layer 13.

#### **Claim 54**

In addition to the reasons provided hereinabove with respect to claim 50, claim 54 provides that the optical material includes quartz or silicon oxide. However, Althaus teaches that the optical material *is silicon* (Althaus at figure 3, column 4, line 20), and *is not quartz or silicon oxide*.

In this regard, Althaus *fails to anticipate* the optical material including quartz or silicon oxide.

#### **Claim 55**

In addition to the reasons provided hereinabove with respect to claim 50, claim 55 provides that the mask layer is composed of a photoresist.

The Examiner's Answer contends that a metal mask layer is a photoresist (Examiner's Answer).

In response, the term "photoresist" as a clear, specific and definite meaning to those within the art. This meaning does not include a metal as a photoresist.

The specification as originally filed provides that a mask layer MS composed of a photoresist layer made from a photosensitive material (specification as originally filed at page 27, figures 3A-3C).

In addition, U.S. Patent No. 6,324,149 to Mifune et al. (Mifune) is cited on the Information Disclosure Statement filed on October 28, 2003 and made of record. Thus, Mifune is not new or non-admitted evidence. Mifune arguably teaches the presence of layer 501, which is described as a photosensitive material 501 (Mifune at figure 8, column 9, lines 58-59). This photosensitive material 501 is used as the *resist* in an etching process (Mifune at figure 8, column 9, lines 63-64). Mifune teaches that a photo-resist conventionally used in semiconductor manufacturing processes may be used as the photosensitive material 501 (Mifune at column 10, lines 4-6). Mifune further provides that a photo-resist conventionally used in semiconductor manufacturing processes may be used as the photosensitive resin 3101 (Mifune at column 20, lines 6-8). Other examples are found within Mifune.

As shown by Mifune and as shown within the originally filed specification for the above-identified application, the meaning to those within the art of the term “photoresist” does not include a metal within that definition. The Examiner’s Answer fails to show that the skilled artisan would have considered the term “photoresist” to also include a metal layer. Instead, the assertion made within the Examiner’s Answer that a photoresist is a metal conflicts with the meaning that is understood by the skilled artisan. As a result, the assertion is a personal conclusion that is unsupported by any objective evidence.

Thus, Althaus *fails to anticipate* the metal layer 13 as being composed of a photoresist.

### **Claim 56**

In addition to the reasons provided hereinabove with respect to claim 50, claim 56 provides that a convex portion of said plurality of convex portions is an optical lens portion of a plurality of optical lens portions.

Figures 1 and 2 of Althaus arguably teaches an optical lens portion 2 having a convex portion 7. However, figures 1 and 2 of Althaus fails to disclose, teach or suggest the height of the convex portion 7 being specified on the basis of a thickness of the metal layer 6.

**Claim 58**

In addition to the reasons provided hereinabove with respect to claim 50, claim 58 provides that a mask layer portion of the plurality of mask layer portions and part of the lens substrate are simultaneously removed.

While Althaus arguably teaches removal of a portion of the metal layer 13 and the slicing of the substrate 10 (Althaus at figure 3), Althaus teaches that a portion of the metal layer 13 is removed prior to the slicing of the substrate 10 (Althaus at column 4, lines 27-32).

Thus, Althaus fails to anticipate the feature of a mask layer portion of the plurality of mask layer portions and part of the lens substrate being *simultaneously* removed.

**Claim 64**

In addition to the reasons provided hereinabove with respect to claim 50, claim 64 a groove is formed in said lens substrate between said convex portion and another of said plurality of convex portions.

The Examiner's Answer refers to a dictionary definition. However, the reference upon which the Examiner's Answer relies has not been made of record. As a result, the definition of a groove that is provided within the Examiner's Answer is a personal conclusion that is unsupported by any objective evidence. As a result, *no objective evidence exists* showing that Althaus teaches a groove that is formed in said lens substrate between said convex portion and another of said plurality of convex portions.

But even if this reference is in existence, the use of this reference would constitute *a new ground of rejection* since Althaus along with this reference would have been necessarily relied upon in making the rejection of this claim. See 37 C.F.R. §41.39.

Thus, Althaus fails to anticipate a groove that is formed in said lens substrate between said convex portion and another of said plurality of convex portions.

**Claim 65-68, 70-72, 74-77**

In addition to the reasons provided hereinabove with respect to claim 50, the features of claims 65-68, 70-72, and 74-77 are absent from the combination of Althaus and Knapp.

The Office Action admits that Knapp has not been relied upon for the convex portion and the mask layer (Examiner's Answer at page 15).

Thus, Althaus and Knapp, either individually or as a whole fail to disclose, teach or suggest the features of the claimed invention.

**Claim 69**

In addition to the reasons provided hereinabove with respect to claims 50 and 65, claim 69 provides that said plurality of optical fibers is arrayed in such a manner that outer peripheral portions of adjacent two of said plurality of optical fibers are in contact with each other.

The Examiner's Answer admits that the exemplary and illustrative figures in Knapp may not explicitly depict optical fibers having their outer peripheral portions in contact with each other (Examiner's Answer at page 14).

Nonetheless, the Examiner's Answer contends that optical fibers having their outer peripheral portions in contact with each other is an inherent feature of Knapp (Examiner's Answer at page 14).

In response to these contention, figure 2 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 15 being in contact with each other. Figure 5 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 115 being in contact with each other.

Yet, the Examiner's Answer contends that in order for the optical interconnect of Knapp to work efficiently and effectively, the fiber holes must be arranged such that the peripheries of the

fibers contact each other (Examiner's Answer at page 15). However, this position set forth within the Examiner's Answer is a personal conclusion that is unsupported by any objective evidence.

Thus, Althaus and Knapp, either individually or as a whole fail to disclose, teach or suggest the features of the claimed invention.

### **Claim 73**

In addition to the reasons provided hereinabove with respect to claims 50 and 65, claim 69 provides that said optical fibers are arrayed in such a manner that outer peripheral portions thereof are in contact with each other.

The Examiner's Answer admits that the exemplary and illustrative figures in Knapp may not explicitly depict optical fibers having their outer peripheral portions in contact with each other (Examiner's Answer at page 14).

Nonetheless, the Examiner's Answer contends that optical fibers having their outer peripheral portions in contact with each other is an inherent feature of Knapp (Examiner's Answer at page 14).

In response to these contention, figure 2 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 15 being in contact with each other. Figure 5 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 115 being in contact with each other.

Yet, the Examiner's Answer contends that in order for the optical interconnect of Knapp to work efficiently and effectively, the fiber holes must be arranged such that the peripheries of the fibers contact each other (Examiner's Answer at page 15). However, this position set forth within the Examiner's Answer is a personal conclusion that is unsupported by any objective evidence.

Thus, Althaus and Knapp, either individually or as a whole fail to disclose, teach or suggest the features of the claimed invention.

**Claim 78**

In addition to the reasons provided hereinabove with respect to claims 50 and 65, claim 78 provides that said optical fibers are arrayed in such a manner that outer peripheral portions thereof are in contact with each other.

The Examiner's Answer admits that the exemplary and illustrative figures in Knapp may not explicitly depict optical fibers having their outer peripheral portions in contact with each other (Examiner's Answer at page 14).

Nonetheless, the Examiner's Answer contends that optical fibers having their outer peripheral portions in contact with each other is an inherent feature of Knapp (Examiner's Answer at page 14).

In response to these contention, figure 2 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 15 being in contact with each other. Figure 5 of Knapp fails to show the outer peripheral portions of adjacent two of the plurality of optical fibers 115 being in contact with each other.

Yet, the Examiner's Answer contends that in order for the optical interconnect of Knapp to work efficiently and effectively, the fiber holes must be arranged such that the peripheries of the fibers contact each other (Examiner's Answer at page 15). However, this position set forth within the Examiner's Answer is a personal conclusion that is unsupported by any objective evidence.

Thus, Althaus and Knapp, either individually or as a whole fail to disclose, teach or suggest the features of the claimed invention.

**Claim 79**

Claim 79 includes the features of:

a light outgoing member having an array of a plurality of light outgoing portions, a light outgoing portion of said a plurality of light outgoing portions emitting light;

a light incoming member having a plurality of light incoming portions, a light incoming portion of said a plurality of light incoming portions receiving said light, said light incoming portion corresponding to said light outgoing portion; and

an optical lens array including a lens substrate made from an optical material and having a plurality of convex portions extending therefrom, a convex portion of said plurality of convex portions having a convex shape and comprising a material the same as that of said lens substrate,

said lens substrate having a mask layer on the surface thereof, said mask layer having a plurality of mask layer portions and comprising a material different than that of said lens substrate, a mask layer portion of said plurality of mask layer portions has a curved surface, a location of said mask layer portion corresponding to a formation region of said convex portion,

said lens substrate being exposed between said mask layer portion and another of said plurality of mask layer portions,

a height and curvature of said convex portion being specified on the basis of a thickness of said mask layer.

The Examiner's Answer refers to its reasoning with respect to claim 50 (Examiner's Answer at page 17). With respect to claim 50, the Examiner's Answer contends that U.S. Patent No. 6,434,297 to Althaus et al. (Althaus) teaches the presences of convex portions 10 (Examiner's Answer at page 4). However, please note that while Althaus arguably teaches the presence of a silicon wafer 10, Althaus teaches the presence of a convex projection 11 (Althaus at figure 3, column 4, lines 21-23).

The Examiner's Answer contends that Althaus teaches the presence of a mask layer 13, and that the height of the convex portion 11 is specified on the basis of a thickness of the mask layer. (Examiner's Answer at page 4). In particular, the Examiner's Answer contends that *the thickness of the mask layer specifies the height of the convex portion, because the mask layer is disposed directly on top of the convex portion and the mask layer demarcates the height of the convex portion* (Examiner's Answer at page 6).

In response to this contention, there is the presence within Althaus of the convex portion 11 (Althaus at figure 3, column 4, line 21). There is also the presence within Althaus of a metal layer 12 on the convex portion 11 (Althaus at figure 3, column 4, lines 26-28).

Within the claims, a height of the convex portion is specified on the basis of a thickness of said mask layer. But please note that within Althaus, the height of the convex projections 11 has been established, (Althaus at figure 3, second figure from the top of the page), prior to the metal layer 13 (Althaus at figure 3, third figure from the top of the page). Also note the presence within figures 1 and 2 of Althaus of a lens 2 having a convex portion 7. However, figures 1 and 2 of Althaus fails to disclose, teach or suggest the height of the convex portion 7 being specified on the basis of a thickness of the metal layer 6.

The Office Action admits that Knapp has not been relied upon for the convex portion and the mask layer (Examiner's Answer at page 15).

Thus, Althaus and Knapp, either individually or as a whole fail to disclose, teach or suggest the features of the claimed invention.

### **Conclusion**

The prior art of record, either individually or as a whole, fails to disclose, teach or suggest all the features of the claimed invention. For at least the reasons set forth hereinabove, the rejection of the claimed invention should not be sustained.

Therefore, a reversal of the Final Rejection of December 17, 2003 is respectfully requested.

If any fee is required or any overpayment made, the Commissioner is hereby authorized to charge the fee or credit the overpayment to Deposit Account # 18-0013.

Dated: November 2, 2004

Respectfully submitted,

By \_\_\_\_\_  
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